

### REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on July 16, 2003, and the references cited therewith.

Claims 1 and 28 are amended, claims 6, 9, 33 and 36 are canceled without prejudice, and no claims are added; as a result, claims 1-5, 7-8, 10-32, 34-35 and 37-54 are now pending in this application.

#### §102 Rejection of the Claims

Claims 1-2, 6-11, 28-29, and 33-38 were rejected under 35 USC § 102(b) as being anticipated by Sheehan et al. (U.S. Patent No. 5,533,085). Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. *In re Dillon* 919 F.2d 688, 16 USPQ 2d 1897, 1908 (Fed. Cir. 1990) (en banc), cert. denied, 500 U.S. 904 (1991). It is not enough, however, that the prior art reference discloses all the claimed elements in isolation. Rather, “[a]nticipation requires the presence in a single prior reference disclosure of each and every element of the claimed invention, *arranged as in the claim*.” *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added).

Applicant respectfully submits that Sheehan does not anticipate claims 1 and 28 as amended. Claim 1 recites “wherein selecting a subset of the images results from a determination of the blurriness of each image.” Claim 28 recites similar language. With respect to now canceled claim 6, the Office Action states that Sheehan teaches the recited language, stating that Sheehan, at column 8, lines 44-58, discloses “evaluating the arteries from the background of the images depending on the brightness (i.e. blurriness).” The Office Action appears to be asserting that blurriness and brightness are the same thing. Applicant respectfully disagrees with this interpretation of Sheehan. Brightness is a level of pixel intensity and does not have anything to do with whether an image is blurry or not. As a result, brightness and blurriness are not the same, and Sheehan does not teach or disclose the recited language. Applicant respectfully requests reconsideration and the withdrawal of the rejection of claims 1 and 28.

Claims 2, 7 and 8 depend from claim 1, and claims 29, 34 and 35 depend from claim 28. These dependent claims inherit the elements of their respective base claims and are allowable for the same reasons as discussed above with respect to the claims 1 and 28.

Additionally, with respect to claim 7, the Office Action states that Sheehan teaches that the “blurriness of the image is determined by a Fourier transform (hereinafter, “FT”) applied to the image.” Applicant respectfully disagrees with this interpretation of Sheehan. Sheehan, at col. 14, lines 58-63, states that FT is used for “analyzing time varying periodic processes in the frequency domain...”. Nowhere in the cited language or elsewhere in Sheehan is it taught or disclosed that FT is used to determine blurriness. As a result, Sheehan does not teach each and every element of claim 7, Applicant respectfully requests the withdrawal of the rejection of claim 7.

Claim 34 recites similar language to claim 7 and is allowable for the reasons discussed above with respect to claim 7.

Furthermore, with respect to claim 8, the Office Action asserts that Sheehan discloses that “blurriness is determined by the mean pixel difference between the image and an adjacent image.” The Office Action cites column 11, lines 22-30 and states that Sheehan “obtains the difference between the pixels within the row and column of an image.” Obtaining the difference between pixels within a row and column of a single image (i.e. frame) is different from obtaining the mean pixel difference between one image and an adjacent image (e.g. one frame and adjacent frame). There is no teaching or disclosure in Sheehan that a difference between adjacent frames is calculated to determine blurriness. As a result, Sheehan fails to teach or disclose each and every element of claim 8. Claim 35 recites similar language to claim 8. Applicant respectfully requests reconsideration and the withdrawal of the rejection of claims 8 and 35.

With respect to claim 10, the Office Action asserts that Sheehan discloses deriving a cardiac cycle, citing column 9, lines 18-20. Applicant respectfully disagrees with this interpretation of Sheehan. The cited language in Sheehan merely states that “during a complete angiography sequence, a patient’s heart will experience a number of cycles.” The cited language does not teach or disclose “deriving a cardiac cycle signal from the plurality of scanned images” as recited in Applicant’s claims 10 and 37, it merely states that such a heart cycle exists. Further,

while Sheehan makes references to the heart cycle, the only enabling teaching is of determining end diastole or end systole. Two points in a heart cycle cannot be equated with deriving a cardiac cycle. Thus, Sheehan does not teach or disclose deriving a cardiac cycle signal.

Additionally, claim 10 recites "assigning a phase in the cardiac cycle to each scanned image." The Office Action appears to assert that detecting motion and showing spatial changes in an image using a spatial analysis method means that Sheehan teaches assigning a phase to each scanned image. Applicant respectfully disagrees with this assertion. Simply performing motion detection and spatial analysis on a sequence of image data clearly is not the same as assigning a phase in a cardiac cycle to each image.

For the above reasons, Sheehan does not teach or disclose each and every element of claims 10 or 37. Applicant respectfully requests reconsideration and the withdrawal of the rejection of claims 10 and 37.

Claims 11 and 38 depend from claims 10 and 37 respectively. They inherit the elements of their respective base claims and add further patentable distinctions. They are therefore allowable for the same reasons as discussed above with respect to claims 10 and 37.

### §103 Rejection of the Claims

Claims 3-5, 12-14, 30-32, 39-41 were rejected under 35 USC § 103(a) as being unpatentable over Sheehan et al. in view of Ben-Haim et al. (U.S. Patent No. 2002/0165448). In order for the Examiner to establish a *prima facie* case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir. 1991)).

Applicant respectfully submits that a *prima facie* case of obviousness does not exist because there is no motivation to combine the references. A factor cutting against a finding of

motivation to combine or modify the prior art is when the prior art teaches away from the claimed combination. A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path the applicant took. *In re Gurley*, 27 F.3d 551, 31 USPQ 2d 1130, 1131 (Fed. Cir. 1994); *United States v. Adams*, 383 U.S. 39, 52, 148 USPQ 479, 484 (1966); *In re Spinnoble*, 405 F.2d 578, 587, 160 USPQ 237, 244 (C.C.P.A. 1969); *In re Caldwell*, 319 F.2d 254, 256, 138 USPQ 243, 245 (C.C.P.A. 1963).

As noted in by the Examiner, Sheehan selects images without reference to an external signal. However, Ben-Haim, teaches that it is preferable to use an external signal in order to acquire images, stating "in the preferred embodiment, the image is acquired at end-diastole in response to an end diastole synch-signal" (see paragraph 186, lines 7-9). As a result Ben-Haim teaches away from selecting images without reference to an external signal. Because Ben-Haim teaches away from selecting images without reference to an external signal, there is no motivation to combine Ben-Haim with Sheehan. As a result, a *prima facie* case of obviousness does not exist with respect to claims 3-5, 12-14, 30-32, and 39-41. Applicant respectfully requests reconsideration and the withdrawal of the rejection of claims 3-5, 12-14, 30-32, and 39-41.

#### Allowable Subject Matter

Applicant notes that claims 15-27 and 42-54 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. As argued above, Applicant believes that the base claims for claims 15-27 and 42-54 are also allowable. Therefore Applicant will defer rewriting claims 15-27 and 42-54 until their respective base claims have been reconsidered.

**CONCLUSION**

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612) 373-6954 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743

Respectfully submitted,

VINCENT J. ARGIRO ET AL.

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.  
P.O. Box 2938  
Minneapolis, MN 55402  
(612) 373-6954

Date January 16, 2004

By

Rodney L. Lacy  
Rodney L. Lacy  
Reg. No. 41,136

**CERTIFICATE UNDER 37 CFR 1.8:** The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 16th day of January, 2004.

Rodney L. Lacy  
Name

Rodney L. Lacy  
Signature

RECEIVED

FEB 03 2004

Technology Center 2600